Message

From: Smalley, Bryant [smalley.bryant@epa.gov]
Sent: 12/3/2019 9:13:35 PM
To: Adams, Adam [Adams.Adam@epa.gov]
Subject: FW: VOCs action level - Texas DSHS question

FYSA

From: Young, Patrick (ATSDR/DCHI/CB) <pay9@cdc.gov>
Sent: Tuesday, December 3, 2019 2:58 PM
To: Smalley, Bryant <smalley.bryant@epa.gov>; Carroll, Craig <Carroll.Craig@epa.gov>
Subject: FW: VOCs action level - Texas DSHS question

From: Nickle, Richard (ATSDR/DTHHS/OD) <ran2@cdc.gov>
Sent: Tuesday, December 3, 2019 12:49 PM
To: Lyke, Jennifer L. (ATSDR/DCHI/CB) <jlf1@cdc.gov>; Young, Patrick (ATSDR/DCHI/CB) <pay9@cdc.gov>
Cc: Louis, Egide (ATSDR/DCHI/CB) <pjv0@cdc.gov>
Subject: FW: VOCs action level - Texas DSHS question

FYI. This is the long email I mentioned in the other email. She asked me at the email at the bottom of the string how to do ERs – more or less. As I tried to imply, this is an on-going event and we can expect other environmental data that may prompt additional responses.

> **From:** Nickle, Richard (ATSDR/DTHHS/OD)
> **Sent:** Tuesday, December 3, 2019 11:08 AM
> **To:** Reategui-Zirena,Evelyn (DSHS) <Evelyn.Reategui-Zirena@dshs.texas.gov>
> **Subject:** RE: VOCs action level - Texas DSHS question
>
> The 0.5 ppm is TCEQ's action level for 1,3-butadiene and the 5 ppm is TCEQ's action level for total VOCs. I'm not exactly sure how they came up with them; if you hear anything, I would be interested. But here are my thoughts on those values and other matters related to this event and how other events may be different.
>
> According to the update this morning, there are still some small fires burning in the plant and there appear to be some releases from damaged tanks as well. Most of the most recent hits have been on the site or very close to the boundaries in the industrial areas around the plant. Not very high and generally lasting 10-20 minutes. This should decrease as the response continues. However, it may be a while before this is completely over.
>
> 0.5 ppm is about equal to the TCEQ 24 hour AMCV of 430 ppb or 0.43 ppb for 1,3-butadiene. I'm not sure why they rounded up instead of down; it may be an instrument thing. That is, they are more confident that 0.5 is an accurate reading while less than that is problematic. The two concentrations are within the total sampling error of each other, so we can't really tell the difference between the two anyway. We were using 10-20 ppb as a screening value in our review of the data that we developed based on an intermediate study with a UF of 1000; that is, we began to look at potential exposures at that lower level. Typically, the duration of exposure was short (15-20 minutes), so we said we would not expect adverse health effects.
>
> For total VOCs, we usually use an action level of 1 ppm based on the chronic MRL for Toluene unless we have reason to expect benzene in the VOC mix. In this case, the total VOCs are probably a mixture of the butadiene and C4 raffinate. Since we are detecting butadiene separately, we can assume the C4 component is the difference in the readings between the butadiene and the Total VOCs. However, most of those hits were along

roadways so they more probably represented automobile exhaust, not from the plant. In essence, we were treating the total VOC readings as the C4 alkanes. Mostly those chemicals are not very toxic, so we didn't comment on the 5 ppm. At other events, if there is benzene present (like at ITC), then our screening values are lower and we wind up looking at the potential exposures at more locations.

RE: generic emergencies. There are a lot of issues with real time field instruments when compared to lab data, though the technology is becoming amazingly sophisticated. They have one really significant advantage over lab data and that is they allow the responders to assess threats and take protective actions today rather than 3 days from now when the lab reports come out. What we usually do, if asked, is recommend that air samples be collected while doing air monitoring with field instruments to confirm the results of the instruments. As the instruments become more sophisticated and achieve lab quality results, that recommendation may become less important. You need to have a feel for the instrument capabilities and limitations and having lab data to back up the readings is usually a good idea.

As a rule, TCEQ values come out about an order of magnitude higher than we would prefer; that is usually between our CV and the POD- especially for organics. However, TCEQ is a risk manager and a regulatory agency; we aren't. Unless we have a hard scientific basis, we won't challenge their values. We may not be able to endorse their values, either. However, when you add in a qualitative assessment of the exposure (e.g., like the short duration of exposure common to many emergences), generally we can agree with their assessment of the risk without agreeing with their values. That may not always be true, but so far that approach has worked. One difference in how values like these are used is TCEQ tends to take their AMCVs as a bright line and the end of their assessment. In the case of butadiene here, 0.4 ppm is safe and 0.6 requires an intervention of some kind. (Not really; there are other factors involved in taking action.) We take our comparison values - action levels or screening values (whatever term of art you prefer, though there are actually differences in the use of those different values) - as the starting point for our assessment. So we can agree 400 ppb is not likely to cause adverse health effects because the duration of exposure is so short. If exposures were longer, then we may not be able to agree. If we have to challenge a risk manager's assessment, we try persuasion first. If we can't convince them, our only option is a public health advisory. An advisory is a really heavy lift for ATSDR. Further, interagency dissension in a response is not a good outcome for anyone. The bottom line is that we need to have a real good reason to dispute the judgement of a risk manager at the scene.

Back to this event: One thing we didn't talk about was cancer. Butadiene is a known human carcinogen according to IARC and NTP and a probable human carcinogen according to EPA. In emergencies, we do not consider cancer unless the agent is known to have a mutagenic action or if there is evidence that acute exposures can result in cancer. Neither condition seems to apply to butadiene. Having said that, we did not know about the air permit violations for this plant when we wrote our interim consult. With the proximity of the neighborhoods, there may be a chronic exposure to butadiene in the community due to those emissions. The chronic concentrations from those recurring emissions are likely below the 10-4 cancer risk and may be much lower given the fate and transport properties of butadiene (dispersion monitoring can help asses that possibility), but it may be something to look at after this event is over. That kind of assessment is not something our ER program can handle, but it may be an issue down the road in this particular case.

The other thing we didn't really talk about was PM in the heavy black smoke. With this kind of fire, the PM was likely the shorter chain PAHs from the C4 Raffinate. We wouldn't expect acid gases like from wildfires or heavy metals from a smelter in this smoke. We didn't talk about those much because the smoke plume was dispersing over the homes, though not as high as the plume during the ITC fire. There may be a deposition problem in areas the plume went over, which is why the County is talking about possible asbestos, but it looks like the Unified Command is pursuing that issue pretty agressively. If they find something, it may be an up and coming issue for us.

The last pathway from an environmental perspective is the runoff water from the firefighting operations. That is getting into the Neches River and causing a sheen - probably from the raffinate since butadiene is so volatile. Some firefighting foam was used, so there may be a PFAS/PFOA issue down the road. However, it

seems like the River is tidal, which usually means brackish water. Unless someone has a desalination plant on the Neches, there are not likely to be any drinking water intakes affected by the runoff. Biouptake does not seem to be much of a problem with these contaminants, but they have found some dead fish and birds around. Mostly, water contamination should be an issue for the fin and feather folks; they are involved in that assessment.

Hope this helps. We still have 2-3 people following this event. We are here – as always - if we need to talk.

Richard A. Nickle, MPH
ATSDR Emergency Response
Atlanta, GA
Ran2@cdc.gov
770-488-3343 (o)
404-791-7951 (c)
770-488-7100 (24/7)
Ask for the ATSDR Duty Officer

From: Reategui-Zirena,Evelyn (DSHS) <Evelyn.Reategui-Zirena@dshs.texas.gov>
Sent: Monday, December 2, 2019 5:16 PM
To: Nickle, Richard (ATSDR/DTHHS/OD) <ran2@cdc.gov>
Subject: VOCs action level - Texas DSHS question

Hi Richard,

We met in Houston during the ITC fire meeting we had at the Harris County Health Department. Heidi Bojes and I were there representing the state. I'm the toxicologist for the Health Assessment and Toxicology team.

I have a question about VOCs during emergency responses. I read the interim consult you wrote regarding the Port Neches explosion. I understand 1,2 butadiene. What I don't really understand is the action level for VOCs. I've seen this EPA air monitoring map saying they use 0.5 ppm for VOCs and I read 5 ppm for the attached report. So, which one is it and I was wondering if you know where they come from. I want to be more prepared for the next incident.

https://response.epa.gov/sites/14566/files/TPC%20AIR%20MONITORING%20MAP%20-%20RP5_rev3.pdf

Thanks
Evelyn

Evelyn G. Reátegui-Zirena, PhD
Toxicologist
Health Assessment & Toxicology Program
Department of State Health Services
Austin, TX 78714
Office: 512-776-6379